

**REMARKS**

Upon entry of the amendment, claims 1-7 will be all the claims pending in the application. Claim 1 has been amended to further define the polyfunctional amine ingredient as being aromatic or aliphatic based on, for example, page 4, lines 20-22 of the specification. Claims 8-16 have been canceled.

Entry of the above amendments is respectfully requested.

**I. Response to Obviousness-type Double Patenting Rejection**

Claims 8-16 have been rejected under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over claim 1 of U.S. Patent No. 6,709,590 and U.S. Patent No. 6,723,422 and claims 3 and 4 of co-pending application 11/242,049.

Without conceding in the merits of the rejection and in view of the cancellation of claims 8-16, it is respectfully submitted that the rejection is moot. Accordingly, withdrawal is respectfully requested.

**II. Response to Rejection under 35 U.S.C. § 102 based on Hirose**

Claims 1-5 and 7-16 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by WO 99/01208 to Hirose (the Examiner is citing to U.S. Patent No. 6,723,422, the U.S. equivalent of WO99/01208).

The rejection is respectfully traversed.

The process in claim 1 is directed to a process for producing a composite semipermeable membrane which comprises forming on a surface of a porous supporting film a thin film comprising a polyamide resin obtained by reacting a polyfunctional amine ingredient with a polyfunctional acid ingredient in the presence of at least an alkali metal hydroxide and an

organic acid, wherein the polyfunctional amine ingredient is an aromatic or aliphatic polyfunctional amine ingredient (emphasis added).

Hirose discloses a method of producing a composite reverse osmosis membrane in which a layer is formed on a porous support by coating the support with a solution A (comprising one or more polyfunctional amines) (col. 2, lines 42-47). Then, this layer is contacted with solution B (comprising one or more polyfunctional acid halide compounds) and further contacted with solution C (comprising polyfunctional acid halide compounds) (col. 2, lines 48-54). In Hirose, the porous support provided with the layer is further contacted with at least either an acidic aqueous solution or an alkaline aqueous solution, i.e. sodium hydroxide, after the contact with solution C (col. 4, lines 13-21).

The Examiner asserts that Hirose expressly teaches adding both an organic acid and sodium hydroxide in the process of producing a composite membrane (page 5 of the Office Action). However, despite the Examiner's assertion, it is clear that col. 4, lines 13-21 teaches adding an acidic aqueous solution or an alkaline aqueous solution. Thus, Hirose does not expressly teach a process of producing a composite membrane in which a thin film comprising a polyamide resin is obtained by reacting a polyfunctional amine ingredient with a polyfunctional acid ingredient in the presence of an organic acid and an alkali metal hydroxide.

The Examiner asserts that solution A contains polyacrylic acid or other organic acids and thus the reaction disclosed in Hirose takes place in the presence of an organic acid and sodium hydroxide (page 3 of the Office Action).

As stated above, Hirose teaches that the porous support provided with the layer is further contacted with at least either an acidic aqueous solution or an alkaline aqueous solution.

Therefore, even if solution A contains an organic acid, there is nothing in Hirose that teaches or discloses that the reaction would take place in the presence of an alkaline aqueous solution, such as sodium hydroxide, and not an acidic aqueous solution. Additionally, there is no example in Hirose in which the porous support is contacted with sodium hydroxide solution after contact with solution C (see example 1).

Furthermore, Hirose does not disclose a single actual embodiment or working example falling within the scope of claim 1.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. Thus, anticipation under §102 requires the identical invention to be shown in the prior art in as complete detail as is contained in the claim. For the above reasons, it is respectfully submitted that Hirose does not disclose the subject matter of claim 1 with the specificity necessary for anticipation under §102.

In view of the foregoing, it is respectfully submitted that Hirose does not anticipate claim 1.

Each of claims 2-7 depend, directly or indirectly, from claim 1, and thus, it is respectfully submitted that these claims are patentable for at least the same reasons as claim 1.

Accordingly, withdrawal of the rejection is respectfully requested.

**III. Response to Rejection under 35 U.S.C. § 102 based on Tomaschke**

Claims 1-16 have been rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Tomaschke, U.S. Patent No. 6,464,873.

The rejection is respectfully traversed.

The Examiner asserts that Tomaschke discloses a process of producing a polyamide membrane made by interfacial polymerization of a polyamine and a polyacid chloride in the presence of camphor sulfonic acid and sodium hydroxide on polysulfone porous membrane and directs Applicants' attention to Example 1.

Applicants respectfully disagree.

In Example 1 in Tomaschke, a 4,4'-bipiperidine reactant, TEACSA and sodium lauryl sulfate are combined. TEACSA contains a salt of triethylamine and camphorsulfonic acid. The aqueous solution of 4,4'-bipiperidine reactant is coated on a substrate and the substrate is contacted with trimesoyl chloride. Triethylamine is a tri-amine, however, the trimesoyl chloride cannot be considered to be reacting with the triethylamine in the process of Tomaschke. Thus, Tomaschke does not disclose the process of claim 1 since Tomaschke does not disclose each and every element of the claim.

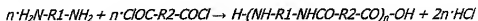
In addition, bipiperidine is an essential component of Tomaschke's invention, whereas claim 1 recites that a polyfunctional amine ingredient is reacted with a polyfunctional acid ingredient in the presence of at least an alkali metal hydroxide and an organic acid, and that the polyfunctional amine ingredient is an aromatic or aliphatic polyfunctional amine ingredient.

Further, the Examiner asserts that Applicants' claimed normality ratio of organic acid to sodium hydroxide is inherently disclosed in Tomaschke since Tomaschke teaches the pH falls in the same range as claimed (see claim 7).

In Example 1 in Tomaschke, the pH of the 4,4'-bipiperidine reactant is adjusted to 12.75. This is outside the pH range recited in claim 7. Additionally, in col. 8, lines 19-22, Tomaschke discloses that the aqueous solution containing a bipiperidine reactant generally has

a pH of about 10 to about 14, preferably about 11 to about 13. Therefore, the normality ratio of organic acid to sodium hydroxide in Tomaschke is also outside the range recited in claim 6.

Moreover, in general, acid chloride and amine react to form polyamide as shown in the following formula.



As shown in the above formula, hydrochloric acid is generated as a by-product separate from the polyamide through the above reaction. The hydrochloric acid needs to be removed to continue the reaction. Although triethylamine mentioned in the Comparative Example of the present application is an alkali and might function to neutralize the hydrochloric acid, the triethylamine will be impaired in the step of curing at 120 °C since the boiling temperature of triethylamine is 89 °C, and then the reaction system will be acidic and the reaction will stop.

In contrast, the alkali metal hydroxide used in the claimed invention is not impaired even in the step of curing, and the reaction continues to produce a membrane having a high rejection rate. As explained above, Tomaschke's latter step (i.e., contacting the membrane after reaction with an alkali aqueous solution) does not contribute to the reaction, and thus, the advantageous effect of the invention is not achieved by Tomaschke's process.

For the above reasons, it is respectfully submitted that Tomaschke does not anticipate claim 1 or the claims depending therefrom.

Accordingly, withdrawal of the rejection is respectfully requested.

#### **IV. Conclusion**

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the

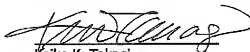
**AMENDMENT UNDER 37 C.F.R. § 1.116  
U.S. Application No. 10/826,301**

**Attorney Docket Q81022**

Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



Keiko K. Takagi  
Registration No. 47,121

SUGHRUE MION, PLLC  
Telephone: (202) 293-7060  
Facsimile: (202) 293-7860

WASHINGTON DC SUGHRUE/265550

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